Please note: These Frequently Asked Questions were prepared by the ARRC for use by market participants and are current as of the version date noted above. However, this document will evolve over time as new developments take place and new questions are raised. If you have a question to which you are seeking an answer, general ARRC inquiries can be directed to the ARRC Secretariat at ARRC@ny.frb.org. The ARRC will endeavor to incorporate those topics below. Please also visit the ARRC’s website or sign up to receive alerts from the ARRC. Thank you.

1. What is the Alternative Reference Rates Committee (ARRC)?

The ARRC, which first met in December of 2014, is comprised of a group of market participants initially convened by the Board of Governors of the Federal Reserve System (Federal Reserve Board) and the New York Fed in cooperation with the U.S. Department of the Treasury (Treasury), the U.S. Commodity Futures Trading Commission (CFTC), and the U.S. Office of Financial Research (OFR) to identify an alternative reference rate for use primarily in derivatives contracts. The ARRC was charged with finding a rate that was more firmly based on transactions from a robust underlying market and that would comply with certain standards, including the IOSCO Principles for Financial Benchmarks. The ARRC was also tasked with preparation of a plan to facilitate the acceptance and use of the selected alternative reference rate on a voluntary basis. Finally, the ARRC was tasked with considering best practices related to robust contract design to ensure that contracts are resilient to the possible cessation or material alteration of existing or new benchmarks.

Given the focus on alternative reference rates for derivatives at the time of its inception, the ARRC initially consisted of representatives from fifteen large global dealers in U.S. dollar interest rate derivatives. As its work progressed, the ARRC invited several central counterparties (CCPs) and other organizations to join. Following the release of its Interim Report and Consultation in May 2016, the ARRC formed an Advisory Group of key end users across a variety of market sectors in order to ensure that its recommendations reflected a wide consensus of market participants.

The ARRC has also held three public roundtables, in June 2016, November 2017, and July 2018 to inform market participants and seek their views. The ARRC’s Interim Report in May 2016 also included a request for comments in order to consult widely and closely with a wide range of market participants with exposure to LIBOR as it sought to finalize a choice of alternative rate and transition strategies. The ARRC’s progress in meeting its initial objectives is summarized in its Second Report, issued in March of 2018.

Andrew Bailey’s speech in July 2017 called into question the availability of LIBOR post-2021 and pushed a wider segment of market participants to focus on their long-standing exposure to LIBOR. After publication of its Second Report, the ARRC was reconstituted in 2018 with an expanded membership to facilitate the much broader interest in mitigating risks related to LIBOR.
2. Which organizations are members of the ARRC?

The ARRC’s structure facilitates collaboration between the market and the official sector. ARRC members currently include both banks and a number of non-banks. The full list of members are here on the ARRC’s website.

3. What is the recommended alternative for USD LIBOR and what other rates were considered?

On June 22, 2017, the ARRC identified the Secured Overnight Financing Rate (SOFR), as its recommended alternative to USD LIBOR. The ARRC considered a comprehensive list of potential alternatives, including other term unsecured rates, overnight unsecured rates such as the Effective Federal Funds Rate (EFFR) and the Overnight Bank Funding Rate (OBFR), other secured repo rates, Treasury bill and bond rates, and overnight index swap rates linked to EFFR. After extensive discussion, the ARRC preliminarily narrowed this list to two rates that it considered to be the strongest potential alternatives: OBFR and some form of overnight Treasury repo rate. The ARRC discussed the merits of and sought feedback on both rates in its 2016 Interim Report and Consultation and in a public roundtable. The ARRC made its final choice of SOFR after incorporating feedback from the consultation and from the members of its Advisory Group.

4. What is SOFR?

SOFR is a fully-transaction based, nearly risk-free reference rate. It is a broad measure of the cost of borrowing cash overnight collateralized by U.S. Treasury securities.

SOFR covers the most volume of transactions of any rate based on the U.S. Treasury repurchase agreement (repo) market. It is based on transaction data from three segments of the Treasury repo market: (i) tri-party repo, (ii) General Collateral Finance (GCF) repo, and (iii) bilateral repo transactions cleared through the Fixed Income Clearing Corporation (FICC). As a good representation of conditions in the overnight Treasury repo market, SOFR reflects an economic cost of lending and borrowing by the wide array of market participants active in the market.

The New York Fed publishes daily SOFR data available here. The New York Fed also publishes a set of SOFR Averages and a SOFR Index, available here. The SOFR Averages are compounded averages over rolling 30-, 90-, and 180-calendar day periods, and the SOFR Index allows for the calculation of compounded average rates over custom time periods.

See FAQ 7 for more information on the significant depth and breadth of transactions underpinning SOFR, which dwarfs the volume underlying LIBOR. See FAQ 17 for details on the use of SOFR Averages in financial contracts and the smoothness of those averages.

5. What was involved in the ARRC’s process for selecting SOFR?
After more than two years of research and consultation, the ARRC identified SOFR as the most suitable alternative reference rate for USD LIBOR.

In recommending SOFR as the alternative reference rate, the ARRC considered a variety of factors, including the depth of the underlying market and its likely robustness over time; the rate’s usefulness to market participants; and whether the rate’s construction, governance, and accounting would be consistent with the IOSCO Principles for Financial Benchmarks.

The ARRC considered the input of a wide range of market participants before selecting SOFR to ensure that its recommendation reflected a wide consensus of market participants. The ARRC received feedback from an Advisory Group it formed, consisting of a diverse set of users of LIBOR-linked products active in a range of market sectors. In addition, the ARRC published an Interim Report and Consultation laying out possible rate choices and seeking market views as it moved to select a rate.

As part of its evaluation process, the ARRC considered a comprehensive list of potential alternatives, including:

- Term unsecured rates
- Overnight unsecured rates like the Overnight Bank Funding Rate (OBFR)
- Term secured rates
- Overnight secured rates like SOFR
- Treasury bill and bond rates

The ARRC ultimately concluded that a term unsecured lending rate would not be robust enough given the limited transactions, unstable samples of borrowers, and sensitivity to market stress that term unsecured borrowing markets exhibit. Although term secured rates were considered, it was determined that there is not sufficient trading to support such a rate.

After extensive discussion, the ARRC narrowed its list of potential alternatives to USD LIBOR to two rates that it considered the be the strongest candidates: an overnight unsecured rate (OBFR) and an overnight Treasury repo rate (SOFR).

In June 2017, the ARRC, with the support of a significant majority of its Advisory Group, announced it had selected SOFR as its preferred alternative to USD LIBOR.

See FAQ 7 for the factors that make SOFR the strongest alternative to USD LIBOR.

6. What makes SOFR the strongest alternative to USD LIBOR?

The ARRC believes that SOFR is the most appropriate reference rate for widespread and long-term adoption because, among other reasons, it is based on transactions in the Treasury repo market, a market, which features both exceptional depth and breadth.

When the ARRC was evaluating potential alternatives to USD LIBOR, it was clear that the transaction volume underlying SOFR were far larger than volume in other U.S. money markets.
Since SOFR first was published in April 2018, daily transaction volume underlying SOFR has averaged more than $980 billion. As shown in the chart below, the transaction volume often has exceeded $1 trillion and it has never been less than $700 billion.

**Daily Transaction Volume Underlying SOFR**

USD Billion

<table>
<thead>
<tr>
<th>Year</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apr-2018</td>
<td></td>
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<tr>
<td>Aug-2018</td>
<td></td>
</tr>
<tr>
<td>Dec-2018</td>
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<td>Apr-2019</td>
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<td>Aug-2019</td>
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<td>Dec-2019</td>
<td></td>
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<tr>
<td>Apr-2020</td>
<td></td>
</tr>
<tr>
<td>Aug-2020</td>
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</tr>
</tbody>
</table>

Source: New York Fed

Not only does the overnight Treasury repo market have significant transaction volume, there also are a wide range of financial market participants that regularly transact in, and have access to it. As such, SOFR reflects activity undertaken by diverse types of institutions, including asset managers, banks, corporate treasurers, insurance companies, money market funds, pension funds, and more. This market reflects the best available measure of the private sector’s near risk-free rate of borrowing relevant to a wide segment of market participants.

The variety of borrowers and lenders active in the repo market underlying SOFR is evidence of the market’s breadth:

- In the tri-party segment of the overnight Treasury repo market, there typically are 40 to 50 different firms borrowing cash each day, and roughly 120 firms lending.¹
- The top ten lenders in the market underlying SOFR account for only just over half of all lending activity. The Herfindahl-Hirschman Index, a widely used measure of market concentration, is below 600 for the market underlying SOFR—a value consistent with a competitive market.²

¹ Nate Wuerffel, *Transitioning Away From LIBOR: Understanding SOFR’s Strengths and Considering the Path Forward*, remarks before the Bank Policy Institute, September 18, 2020.
² Wuerffel, remarks.
In 2020, repo transactions cleared through the FICC have accounted for roughly 60% of daily transaction volume underlying SOFR. Within that segment of the market alone, there are roughly 2,000 entities who are eligible to transact, either as members of FICC or through its “sponsored membership” program.³

Beyond direct participation in the Treasury repo market, there are a significant number of entities with indirect exposure to the market. For example, any investor in the $4.5 trillion money market fund industry likely has exposure to the repo market. Similarly, pension funds that serve millions of members typically lend cash in the repo market.⁴

The breadth of this market is critical to enabling SOFR to accurately reflect market conditions today. It also positions SOFR to adapt as the repo market evolves, so that it will continue to reflect a deep, liquid, and broad market over time. After all, SOFR’s underlying market is the largest rates market at a given maturity in the world, and SOFR encompasses the widest coverage of the market available.

Finally, how SOFR is administered, produced, and publicly published also contribute to making it such a strong alternative reference rate.

See FAQ 5 for more details on repo market segments underlying SOFR. See FAQ 8 for details on the New York Fed’s approach to producing SOFR, including insuring it is produced in accordance with internationally-accepted best practices.

⁴ SOFR Starter Kit: Factsheet 2, ARRC.
7. Who administers and produces SOFR and how is the rate production process reviewed?

The New York Fed is the administrator of SOFR and produces the rate in cooperation with the Treasury Department’s Office of Financial Research (OFR). The New York Fed publishes SOFR on a daily basis on its website at approximately 8:00 a.m. eastern time. Additionally, the New York Fed publishes 30-, 90-, and 180-day SOFR Averages and a SOFR Index to support a successful transition away from USD LIBOR.

An internal New York Fed Oversight Committee periodically reviews the rate production process. The Oversight Committee consists of members from across the New York Fed’s organizational structure who are not involved in the daily production of SOFR. It is chaired by the New York Fed’s Chief Risk Officer and includes senior staff from various control areas of the New York Fed, in addition to a representative from the OFR.

As mentioned in FAQ7, SOFR is well-placed to adapt as the repo market evolves. The depth of its underlying market and its ability to continue to accurately measure funding costs in the U.S. Treasury repo market, means SOFR can be expected to remain robust over time.

The New York Fed has endeavored to adopt policies and procedures consistent with best practices for financial benchmarks, including the IOSCO Principles for Financial Benchmarks. Annually, the New York Fed assesses the compliance of the reference rates it administers and produces with the IOSCO Principles and releases an IOSCO Statement of Compliance online.

For more information on the production of SOFR and the New York Fed’s other repo reference rates, see here and here. For daily prints of SOFR, see here.

8. Is SOFR meant to co-exist with LIBOR, or is it meant to replace LIBOR?

The ARRC’s focus is to encourage voluntary adoption of SOFR, rather than to mandate a transition away from USD LIBOR. SOFR, therefore, will co-exist with USD LIBOR as long as USD LIBOR is published, offering market participants an alternative reference rate for new transactions.

Although the adoption of SOFR is voluntary, the impending discontinuation of LIBOR makes it essential that market participants consider moving to alternative rates such as SOFR and that they have appropriate fallback language in existing contracts referencing LIBOR.

The ARRC has proposed robust fallback language for new cash products that continue to reference LIBOR. The ARRC is currently working to ensure the success of its Paced Transition plan and to promote the use of SOFR on a voluntary basis and has developed Recommended Best Practices that market participants can choose to adopt to help support a smooth transition away from LIBOR.

SOFR is the ARRC’s preferred alternative to USD LIBOR. The ARRC remains focused on facilitating a smooth transition away from USD LIBOR, and believes that SOFR is the
strongest alternative rate. It’s a robust rate that can be used in a wide variety of products, and it’s available now.

The ARRC supports a vibrant and innovative market with reference rates that are robust, IOSCO compliant, and available for use before the end of 2021. The ARRC’s recommendations have always been voluntary and it recognizes that market participants may choose other rates, but any solutions must be robust.

9. Who will be impacted by this transition from LIBOR to SOFR?

The total exposure to USD LIBOR, as of the end of 2016, is close to $200 trillion, roughly equivalent to 10 times U.S. Gross Domestic Product. Although the notional size of the derivatives markets accounts for 95 percent of the outstanding gross notional value of all financial products referencing USD LIBOR, it is also referenced in several trillion dollars of corporate loans, floating-rate mortgages, floating rate notes, and securitized products. Due to the broad use of USD LIBOR as a reference rate, all financial market participants including retail customers, corporations, issuers, investors, asset managers, service providers of financial products, and large financial institutions are impacted by the risks associated with USD LIBOR.

In addition, LIBOR is extensively used across a range of business processes (for example, accounting, valuation, and financial modeling) across many industries. Hence, beyond financial products and legal contracts, businesses that have exposure to USD LIBOR embedded in their business processes are also likely to be impacted.

10. What sort of financial products are expected to reference SOFR?

SOFR is a fully transaction-based, overnight near risk-free reference rate and is a good representation of general funding conditions in the U.S. money markets. As such, SOFR is suitable to be used across a broad range of financial products, including but not limited to, derivatives (listed, cleared, and bilateral-OTC), and many variable rate cash products that have historically referenced LIBOR. The ARRC’s Paced Transition Plan also contemplates the development of term SOFR rates to better accommodate certain cash products (e.g. corporate loans) that may require a forward-looking term rate. In addition, SOFR is also suitable as a reference rate to be used as a general proxy for interest rates in a range of business processes (accounting, valuation, and financial modeling).

The heightened risk that LIBOR will stop after 2021 makes it essential that market participants consider moving to alternative rates. SOFR should be considered for use in both new products and as a fallback for USD LIBOR in existing contracts that reference USD LIBOR.

11. What is “fallback language”?

In this context, “fallback language” refers to the legal provisions in a contract that apply if the underlying reference rate in the product (e.g. LIBOR) is discontinued or unavailable. The
FSB’s Official Sector Steering Group (OSSG) has recommended that market participants both understand their contractual fallback arrangements and ensure that those arrangements are robust enough to prevent potentially serious market disruptions in a LIBOR cessation event. The ARRC supported this recommendation in its Second Report, and in July 2018, the ARRC released its guiding principles for the development of fallback language in new financial contracts for cash products. Because LIBOR is a heavily-used reference rate, its permanent cessation without viable fallback language in contracts would cause considerable disruption to financial markets and uncertainties around the large gross flows of USD LIBOR–related payments and receipts between many financial participants. It would also impair the normal functioning of a variety of markets, including business and consumer lending.

12. What should market participants do to strengthen fallback language in derivatives?

Fallback provisions for LIBOR in derivatives contracts currently trigger only if a temporary cessation of LIBOR occurs (e.g., a computer glitch) and may not be workable and could lead to an unintended economic outcome if LIBOR ceases to be published. Accordingly, in July 2016, the OSSG requested that the derivatives industry trade group (the International Swaps and Derivatives Association, or ISDA) lead a cross-currency initiative to improve derivatives contract robustness to address risks of discontinuance of widely-used interest rate benchmarks, including LIBOR. As such, ISDA is in the process of updating the definitions of USD LIBOR and other key benchmarks tied to interbank funding markets used in derivatives contracts to include new fallbacks (SOFR with certain contemplated adjustments for USD LIBOR) in the event of a permanent discontinuation of the relevant benchmark. ISDA also plans to publish a multilateral protocol to assist market participants in including the amended definitions (i.e., the definitions with fallbacks for benchmark cessations) in legacy swap contracts. In contrast to non-derivatives (cash products), because of the standardization of derivative contracts and the leadership of ISDA described above, updating fallbacks in LIBOR-based derivatives contracts should be relatively straightforward. ISDA has not yet finalized its fallback language primarily because of plans to apply both a credit spread adjustment and a term fixing adjustment at the time of the fallback to SOFR. In order to select the best methods for calculating such adjustments, ISDA will be inviting market participants to weigh in on a number of proposed methodologies during market-wide consultations, the first of which is open until October 12, 2018.

13. What should market participants do to strengthen fallbacks in cash products?

As discussed above, in order to protect against a potential cessation of LIBOR, it is recommended that market participants include more robust fallback language in LIBOR-based non-derivatives contracts, including loans, bonds, securitizations, consumer mortgages, etc. (collectively, “cash products”). The challenge of preparing consistent and durable new fallback language for various cash products has drawn the attention of the ARRC, which has formed a number of cash product-focused working groups leveraging experts in its expanded membership to review alternative fallback language. Although the timing and method of implementing new fallbacks in cash products will vary with the product type, the ARRC plans to consult on standardized fallback language available for voluntary adoption for a variety of cash products by the end of 2018.
14. How does SOFR compare to other “IBOR” alternatives selected in other countries?

The FSB identified its concerns on the vulnerability of LIBOR across currencies. As a result, the need to transition away from LIBOR to alternative reference rates is not limited to USD LIBOR. Most major currency jurisdictions have identified a need for reforming major interest rate benchmarks. Public/private-sector working groups similar to the ARRC have been formed in the other currencies for which LIBOR is quoted.

The alternative reference rates selected by the major currency areas are outlined in the table below. Most have selected some form of overnight rate:

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Working Group</th>
<th>Alternative Rate</th>
<th>Secured vs. Unsecured</th>
<th>Overnight vs. Term</th>
<th>Rate Administration</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S.</td>
<td>Alternative Reference Rates Committee</td>
<td>SOFR</td>
<td>Secured</td>
<td>Overnight</td>
<td>Federal Reserve Bank of New York</td>
</tr>
<tr>
<td>Switzerland</td>
<td>The National Working Group on Swiss Franc Reference Rates</td>
<td>Swiss Average Rate Overnight (SARON)</td>
<td>Secured</td>
<td>Overnight</td>
<td>SIX Swiss Exchange</td>
</tr>
<tr>
<td>Japan</td>
<td>Study Group on Risk-Free Reference Rates</td>
<td>Tokyo Overnight Average Rate (TONAR)</td>
<td>Unsecured</td>
<td>Overnight</td>
<td>Bank of Japan</td>
</tr>
<tr>
<td>Euro area</td>
<td>Working Group on Risk-Free Reference Rates for the Euro Area</td>
<td>Euro Short-Term Rate (ESTER)</td>
<td>Unsecured</td>
<td>Overnight</td>
<td>ECB</td>
</tr>
</tbody>
</table>

15. Is SOFR too volatile to be used in financial contracts?
Some have questioned whether the volatility seen with daily SOFR makes using SOFR in financial contracts less practical. SOFR has been volatile at times when the underlying U.S. Treasury repurchase agreement market that it is designed to capture has been volatile, and SOFR accurately measures this underlying market. However, comparing an overnight rate to a term rate is like comparing apples to oranges.

While it clearly is the case that SOFR and other overnight repo rates are inherently more volatile than term rates on a day-to-day basis, it is important to remember that contracts referencing SOFR have been based on averages of these daily rates (see SOFR Averages and Index Data). SOFR futures and OIS, and the many SOFR floating rate notes that have been issued all use an average of SOFR over a fixed period of time as the floating rate paid under the terms of the contract, not a single day’s realization of SOFR.

These averages of SOFR have been quite smooth and can be easily referenced in financial contracts, as demonstrated by the growing use of SOFR in futures, swaps, and floating-rate debt. The ARRC’s Second Report (Figure 5 of the report) emphasized this point, showing that a 3-month average of overnight Treasury repo rates has historically been less volatile than 3-month U.S. dollar LIBOR over a wide range of market conditions.

The charts below similarly make clear that this remains the case, even given the volatility witnessed in repo markets in mid-September 2019 and over year-end 2018. The first chart below shows SOFR along with 30-, 90- and 180-day averages of SOFR. The volatility in SOFR is clearly visible, but it also can be seen to have had negligible impact on the averages of SOFR. The second chart clearly demonstrates that the point made in the ARRC’s Second Report remains true: a 90-day average of SOFR is less volatile than 3-month LIBOR. For example, although SOFR rose sharply in mid-September 2019 due to a number of factors, including the issuance of Treasury securities, a 90-day average of SOFR only rose 2 basis points relative to the week before those fluctuations, while 3-month LIBOR rose 4 basis points.
11 Day Average SOFR Remains Less Volatile than 3-Month USD LIBOR

Source: Bloomberg, FRBNY, ICE Benchmark Administration
Note: SOFR Average values prior to March 2, 2020 are indicative
16. What is the ARRC’s view on how the COVID-19 pandemic influences LIBOR’s end-2021 expiration date?

The ARRC continues to focus on the established timeline for the transition from LIBOR.

The ARRC recognizes that near-term, interim steps may be delayed given the current economic environment with the global pandemic, but given the latest announcements from the official sector reiterating the overall expected timeline (see here and here), it remains clear that the financial system should continue to move to transition by the end of 2021.

The ARRC is advancing its work forward during this period and will continue to do so, as laid out in its 2020 objectives.

17. How do the Q4 2020 announcements by regulators and IBA about USD LIBOR’s proposed endgame impact the ARRC’s Recommended Best Practices?

As part of the announcements on USD LIBOR’s proposed endgame, U.S. regulators (the Federal Reserve Board, Federal Deposit Insurance Corporation, and Office of the Comptroller of the Currency) issued supervisory guidance noting that “the agencies encourage banks to cease entering into new contracts that use USD LIBOR as a reference rate as soon as practicable and in any event by December 31, 2021.”

At its December 9 meeting, the ARRC discussed how these announcements align with the ARRC’s Recommended Best Practices. ARRC members observed that the supervisory guidance clearly called for no new LIBOR as soon as practicable (and no later than 2021), and that the ARRC’s Recommended Best Practices dates for no new issuances by product type were set with such a goal in mind.

Given that, ARRC members concluded that its recommended guidelines are fully consistent with the timelines and message set out in the U.S. supervisory guidance and the IBA and FCA announcements.